

CLAIMS

1. A method for determining an optimal transition-limiting code for use in a multi-level signaling system, the method comprising the steps of:

5 determining a coding gain for each of a plurality of transition-limiting codes; and

 selecting one of the plurality of transition-limiting codes having a largest coding gain for use in the multi-level signaling system.

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2. The method of claim 1, wherein the plurality of transition-limiting codes reduce or eliminate full-swing transitions between signal levels in the multi-level signaling system.

15 3. The method of claim 2, wherein at least some of the plurality of transition-limiting codes have different degrees of reduction or elimination of full-swing transitions between signal levels in the multi-level signaling system.

20 4. The method of claim 3, wherein the step of determining a coding gain for each of a plurality of transition-limiting codes comprises the steps of:

 a.) selecting a first transition-limiting code having a

first degree of reduction or elimination of full-swing
transitions;

b.) determining the coding gain of a data transmission over
a channel operating at a predetermined data rate in the multi-
5 level signaling system utilizing the first transition-limiting
code based at least in part upon the first degree of reduction
or elimination of full-swing transitions; and

c.) repeating steps a and b utilizing a second transition-
limiting code having a second degree of reduction or elimination
10 of full-swing transitions.

5. The method of claim 3, wherein the step of determining a
coding gain for each of a plurality of transition-limiting codes
comprises the steps of:

15 a.) characterizing a first pulse response for a channel
operating at a predetermined data rate in the multi-level
signaling system utilizing a first transition-limiting code
having a first degree of reduction or elimination of full-swing
transitions;

20 b.) determining the coding gain of a data transmission over
the channel using the first transition-limiting code based at
least in part upon the first degree of reduction or elimination
of full-swing transitions; and

c.) repeating steps a and b utilizing a second transition-limiting code having a second degree of reduction or elimination of full-swing transitions.

5 6. The method of claim 1, wherein at least some of the plurality of transition-limiting codes have different sampling rates.

7. The method of claim 6, wherein the step of determining a coding gain for each of a plurality of transition-limiting codes comprises the steps of:

a.) selecting a first transition-limiting code having a first sampling rate;

15 b.) determining the coding gain of a data transmission over a channel operating at a predetermined data rate in the multi-level signaling system utilizing the first transition-limiting code based at least in part upon the first sampling rate; and

c.) repeating steps a and b utilizing a second transition-limiting code having a second sampling rate.

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8. The method of claim 6, wherein the step of determining a coding gain for each of a plurality of transition-limiting codes comprises the steps of:

a.) characterizing a first pulse response for a channel
operating at a predetermined data rate in the multi-level
signaling system utilizing a first transition-limiting code
having a first sampling rate;

5 b.) determining the coding gain of a data transmission over
the channel using the first transition-limiting code based at
least in part upon the first pulse response; and

c.) repeating steps a and b utilizing a second transition-
limiting code having a second sampling rate.

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9. The method of claim 1, wherein the coding gain for each of
a plurality of transition-limiting codes comprises:

15 a first component based upon a sampling rate of a pulse
response for a channel operating at a predetermined data rate in
the multi-level signaling system utilizing the transition-
limiting code; and

20 a second component based upon a degree of reduction or
elimination of full-swing transitions between signal levels in
the multi-level signaling system utilizing the transition-
limiting code.

10. At least one signal embodied in at least one carrier wave
for transmitting a computer program of instructions configured

to be readable by at least one processor for instructing the at least one processor to execute a computer process for performing the method as recited in claim 1.

- 5 11. At least one processor readable carrier for storing a computer program of instructions configured to be readable by at least one processor for instructing the at least one processor to execute a computer process for performing the method as recited in claim 1.